

A REVISION OF THE GENUS *STALARIA* HARRINGTON
(HEMIPTERA: LYGAEIDAE)¹

JAMES A. SLATER AND LE YI ZHENG

(JAS) Section of Systematic and Evolutionary Biology, University of Connecticut, Storrs, Connecticut 06268; (LYZ) Department of Biology, Nankai University, Tianjin, China.

Abstract.—The genus *Stalaria* is revised. A key to species is given. *Stalaria lestoni* (West Africa) and *S. nana* (East and South Africa) are described as new species. The misidentification of the type species is noted. It is concluded that the designated type species *Pamera ferruginosa* Stål was based on specimens of *Pachybrachius kisseis* Linnavuori. There is discussion of the systematic relationships of *Stalaria* to several other myodochine genera. Figures are given of anatomical details of the male genitalia and a dorsal view of *S. lestoni*.

The genus *Stalaria* was erected by Harrington (1980) with *Pamera ferruginosa* Stål as type species and to include *Pachybrachius kisseis* Linnavuori and *Pachybrachius nysias* Linnavuori.

As we have previously pointed out (Slater and Zheng 1985) unfortunately the genus is based upon a misidentified type species. Harrington's *P. ferruginosa* Stål actually consisted of a series of specimens of *P. kisseis* that had previously been reported by Slater (1972) as probably a new species near *Pachybrachius ferruginosus*. This situation under the International Rules of Zoological Nomenclature must be referred to the International Commission for resolution. Accordingly, in order not to add an additional name to the literature we will be asking the commission to set aside *Pamera ferruginosa* Stål as type species of *Stalaria* and to replace it with *Pachybrachius kisseis* Linnavuori. If the commission approves this action it will retain *Stalaria* in the sense intended by Harrington. It is in this sense that we treat the species in the following discussion.

Harrington (1980) defined the genus as a myodochine taxon with her "Type 1 phallus"; a narrow impunctate ring-like pronotal collar; a body length more than 3½ times the pronotal width; with numerous elongate dorsal body hairs; single ranked fore femoral spines; multi-branched holding sclerite; four or more rows of claval punctures; a v-shaped buccular junction; closed epimeron, and unspined male fore tibiae.

Harrington (ibid.) indicated that *Stalaria* is part of a very closely related group of genera that include *Pamerapa*, *Pamerarma*, *Remaudieriana* and probably *Pachybrachius* (*sensu* Harrington).

Stalaria is not such a well defined genus as this might suggest as only the type

¹ This work was supported in part by a grant from the National Science Foundation.

species has the "comb-like holding sclerite" (Fig. 12). (It is not a holding sclerite). Further, all of the species examined, including the proposed type species, have double-ranked spines, although sometimes weakly so. However, the genitalia do have synapomorphic features such as the shape of the holding sclerites and especially the unique single, slender median sclerite situated dorsad of the ejaculatory duct. For the present, we believe these species should be placed together in a single genus. One of the superficial but interesting features of these species is that the pale annulus on the fourth antennal segment is located distally or mesally rather than at the base as it is in so many rhyparochromine genera.

The relationships of several of these myodochine genera seems to us to warrant additional study. Some species of *Stigmatonotum* have the enveloping sclerotization of the vesica (= the "casing sclerotization"? of *Pachybrachius* of Harrington, 1980) almost exactly the same as that found in *Stalaria lestoni*. In addition *Stalaria* species usually have several small hairs along the apical corial margin that are somewhat similar to the punctures along this margin that Harrington considers diagnostic for *Stigmatonotum*.

We have studied the male genitalia of an unidentified species of *Pamerarma* Malipatil, a genus Harrington says is closely related to *Stalaria*. This species has genitalia quite different from Harrington's "Type I" in that holding sclerites are absent, there is a pair of conjunctival plates (perhaps homologous with the conjunctival spine?) and there are fine marginal serrations on the thin proximal part of the helicoid process. These features resemble those of the "Type II" phallus. Harrington (1980) noted this but still considered *Pamerarma* to represent "Type I." We feel that the most essential feature of the "Type I" phallus is the presence of holding sclerites and the most crucial feature of "Type II" is their absence. If this is true *Pamerarma* should belong in a clade with *Paromius*, *Horridipamera* etc.

The essence of the question is that *Stalaria* (and perhaps *Pamerarma*) have a somewhat intermediate position in what would seem to be a polarity trend from a "Type I" to a "Type II" phallus. If this true the sister group relationships of *Stalaria* will certainly benefit from additional analysis.

Distribution: Confined to tropical Africa, one species extending southward into the tropical corridor of Zululand, South Africa.

All measurements are in millimeters.

KEY TO SPECIES OF *STALARIA*

- 1. Posterior pronotal lobe nearly uniformly pale, strongly contrasting with dark anterior lobe. Phallus without conjunctival spines, only a pair of holding sclerites present. Small species not over 4.5 mm. *nana*
- Posterior pronotal lobe chiefly reddish brown often nearly unicolorous with anterior lobe, sometimes with alternating pale and dark ferruginous longitudinal stripes. Phallus with conjunctival spines. Usually more than 4.5 mm in length. 2
- 2. Large species at least 6 mm in length; antennal segment IV usually chiefly dark brown with only a narrow pale annulus near middle, sometimes entirely dark, rarely with a broad pale central area. Aedeagus with a pair of comb-like dorsal conjunctival sclerites. (Fig. 12) *kisseis*
- Smaller species not over 5.5 mm in length. Antennal segment IV either

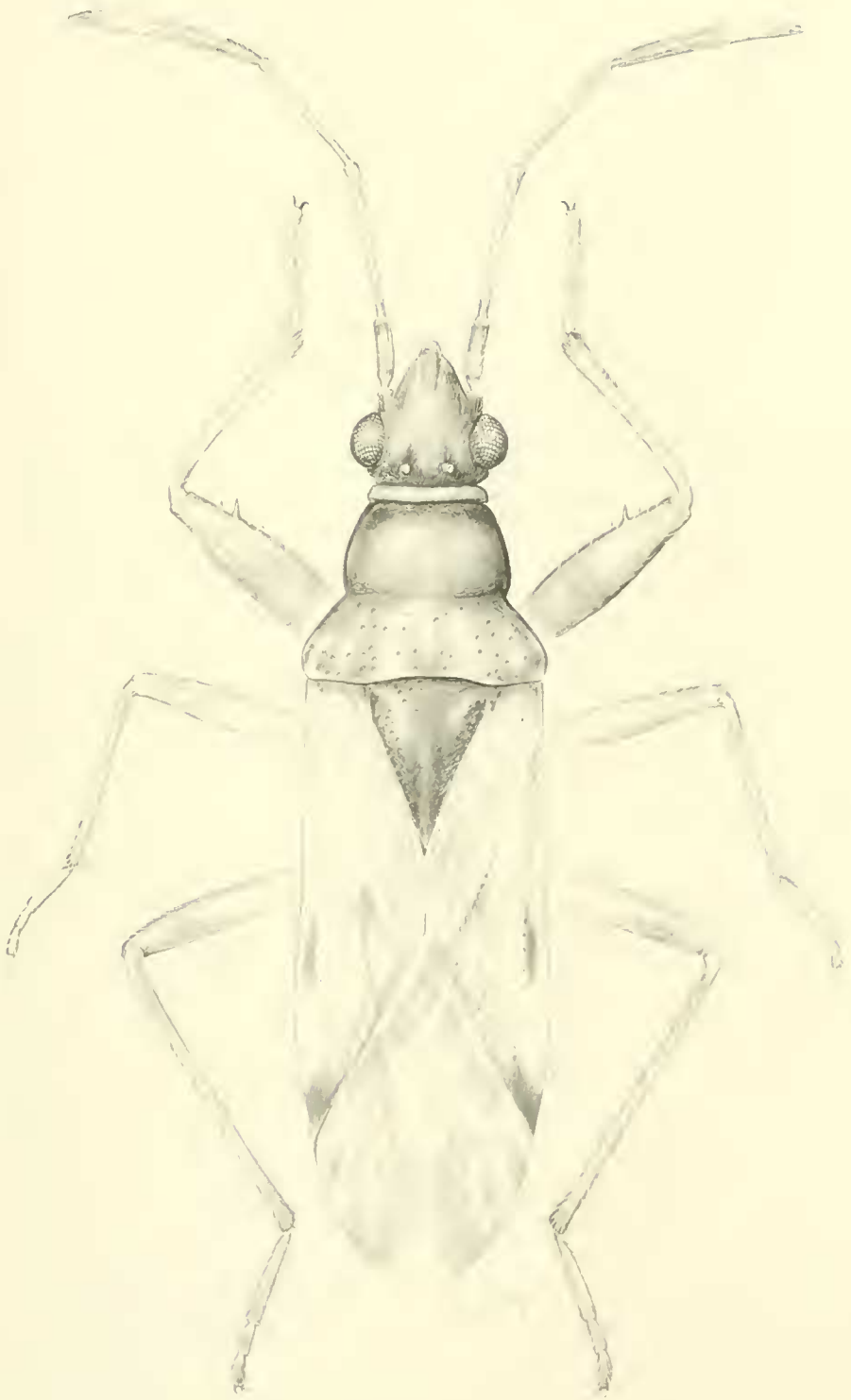


Fig. 1. *Stalaria lestoni* n. sp., dorsal view.

- chiefly pale, darkened only at proximal and distal ends, or with only a subapical pale annulus present. Aedeagus lacking a pair of comb-like dorsal conjunctival sclerites. 3
3. Apex of corium with a well developed black macula; fourth antennal segment pale on apical $\frac{1}{2}$ to $\frac{1}{3}$ with exception of extreme apex; lateral plate-like structure on vesica weak, small, sharp, and narrow (Fig. 8); inner basal area of paramere lacking a secondary tooth (Fig. 14). *lestoni*
- Without a conspicuously differentiated dark macula at apex of corium; fourth antennal segment chiefly pale, dark only near proximal and distal ends; lateral vesical plate broad, triangular and well defined (Fig. 7); inner basal area of paramere with a slender tooth (Fig. 9). *nysias*

Stalaria lestoni NEW SPECIES

Figs. 1, 5–6, 8, 14

Body narrow, elongate, parallel-sided. Head, pronotum, and scutellum chestnut brown. Antennal segments I–III yellow, segment III infuscated at distal end. Fourth antennal segment dark brown with a broad yellow subapical annulus. Pronotal collar and posterior pronotal margin yellowish, latter with a pair of small yellow spots submedially. Scutellum with an elongate lighter longitudinal reddish stripe. Ground color of hemelytra dull yellow, with some punctures and a submedian and apical corial macula dark brown. A diffuse dark streak around inner portion of triangular pale macula that is present at inner angle of corium. Membrane gray brown, with light veins and a white apical spot. Legs yellowish. Femora, especially fore femora, with a brown submedian annulus, (sometimes incomplete and broken into a series of dark spots). Venter yellowish to light brown, with a sublateral longitudinal dark brown stripe on each side. Anterior pronotal lobe as well as collar impunctate. Posterior pronotal lobe and scutellum shallowly and inconspicuously punctate.

Head length 0.75, width 0.75, interocular space 0.37. Pronotum dull or subshining, not pruinose. Clothed with short decumbent, sericeous pubescence (on anterior lobe mainly surrounding large calli area) and sparse erect long hairs. Pronotal length 0.95. Anterior and posterior lobes subequal in length, width anterior lobe 0.80, width posterior lobe 1.2. Scutellar length 0.75, width 0.65, with a low Y-ridge present. Clavus with 4 rows of punctures, the second inner row incomplete, only occupying posterior half of scutellum. Length claval commissure 0.50. Midline distance apex clavus-apex corium 1.05. Midline distance apex corium-apex membrane 0.65. Fore femur ventrally with one dark spine distally on outer side. Inner side of fore femur distally with 1 large and 3 small spines, 2 of latter proximad of and 1 distad of the large spine. Male tibiae straight, without a tooth or spine. Labium extending to middle of mesosternum but remote from mesocoxae. Length labial segments I 0.48, II 0.48, III 0.30, IV 0.32. Antennae conventionally terete. Length antennal segments I 0.48, II 0.86, III 0.72, IV 0.96. Male genital capsule similar to that of *S. nysias* (Linnavuori), but proximal opening a little longer and narrower (Fig. 16). Parameres lacking an accessory tooth along inner margin of shaft (Fig. 14). Holding sclerite slender, apex more sclerotized than in *nysias* and curved (Figs. 5, 6). Very weak sclerotization enveloping ventral and lateral sides of proximal portion of vesica; when viewed laterally, a pair of weakly sclerotized, narrow triangular plates vaguely evident, representing holding sclerites. Total body length 4.80.



Figs. 2-17. Figs. 2-6. Holding sclerites. 2, *Stalaria kisseis* Linnavuori, right side view. 3, *Stalaria nysias* Linnavuori, ventral view. 4, *Stalaria nysias* Linnavuori, right side view. 5, *Stalaria lestoni* n. sp., ventral view. 6, *Stalaria lestoni* n. sp., right side view. Figs. 7-8. Dorsal conjunctival sclerites. 7, *Stalaria nysias* Linnavuori. 8, *Stalaria lestoni* n. sp. Figs. 9-10. Parameres. 9, *Stalaria nysias* Linnavuori. 10, *Stalaria nana* n. sp. Fig. 11. *Stalaria kisseis* Linnavuori, aedeagus. Fig. 12. *Stalaria kisseis* Linnavuori, dorsal conjunctival sclerite. Fig. 13. *Stalaria kisseis* Linnavuori, lateral conjunctival sclerite. Figs. 14-15. Parameres. 14, *Stalaria lestoni* n. sp. 15, *Stalaria kisseis* Linnavuori. Figs. 16-17. Pygophores. 16, *Stalaria lestoni* n. sp., dorsal view. 17, *Stalaria nana* n. sp., dorsal view.

Holotype.—♂: GHANA: Tafo, 7.X.1967, (J. A. & S. Slater, Toby Schuh). In American Museum of Natural History.

Paratypes.—3 ♂, 2 ♀, same data as holotype. 3 ♂, same, 4–9.X.1967. 1 ♀, same, 8.X.1967, (UV light). 1 ♀, same, 9.X.1967, (UV light). 1 ♀, same, 5.X.1967, (UV light). 1 ♀, Accra, 14.XI.1969, (Blacklight Trap) (G. W. Campbell). 1 ♀, Wiowso, 3.IV.1969, (D. Leston). 1 ♀, Kankan, 7.XII.1965, (Leston). 1 ♀, Legon, (Light trap) (Leston). 1 ♀, Mt. Atewa, 7.XII.1968, (D. Leston). NIGERIA: Ile-Ife, 4 ♂, 2 ♀, 10.III.1969, (J. T. Medler). 1 ♀, Oban RH SE State, 7.IV.1976, (J. T. Medler). 1 ♀, Umuahia CRIN EC State, 9.IV.1975, (J. T. Medler). 1 ♂, Lagos, Lagos-Badagry Road, 25.I.1975, (A. Hamid). 1 ♂, R. St. Ebubu nr. Bori, 2.VII.1973, (Linnavuori). 4 ♂, W. St. Ife, 7–8. VII–14.VII.1973, (Linnavuori). 1 ♂, W. St., Olokemeji Forest, 9.VII.1973, (Linnavuori). CENTRAL AFRICAN REPUBLIC: 7 ♂, 1 ♀, La Maboke, 6–9.VI.1973, (Linnavuori). IVORY COAST: 1 ♂, Adiopodoume, 29.IX–7.X.1973, (Linnavuori). 1 ♂, Goumere, 19.IX.1973, (Linnavuori). CAMEROON: 1 ♀, Bota, 19–20.VI.1973, (Linnavuori). 1 ♂, 50 KM W Douala, Moliwe, 22.I.1978, (at light) (secondary forest and plantation) (Lund University Expedition). GAMBIA: 3 ♂, 1 ♀, Abuko Nature Reserve 18 .30'–20 .30', 18.XI.1977, (at light at bamboo pool) (Lund University Expedition). SENEGAL: 1 ♂, 1 KM NE Djibelor (about 7.5 KM SW Ziguinchor) (19.00–21.00) 9.XI.1977, (at light) (Lund University Expedition).

This species is named for the late Dr. Dennis Leston in recognition of his many distinguished contributions to Hemipterology.

Stalaria lestoni is closely related to *S. nysias* Linnavuori. It tends to be a more slender, relatively elongate species and externally may be distinguished by the characters given in the key (see *nysias* discussion.) The lack of a secondary tubercle on the inner shaft of the paramere and the shape of the conjunctival appendages on the phallus are diagnostic.

It appears to be common at light in West Africa.

Stalaria nysias (Linnavuori)

Figs. 3–4, 7, 9

1978. *Pachybrachius nysias* Linnavuori, 153:89.

1980. *Stalaria nysias* Harrington, 167:91.

We have examined a single male paratype of this species. While the paratype examined differs considerably in color from all specimens of *lestoni* (even those from the Central African Republic) we would not consider these color differences alone to be significant. However, both the parameres and conjunctival appendages are definitely different. *Stalaria nysias* has a secondary tooth on the inner side of the paramere shaft (Fig. 9) which is absent in all of the specimens of *lestoni* which we have examined (Fig. 14). The holding sclerites of *S. nysias* are relatively thicker than are those of *lestoni* and are not hooked at the distal end (Figs. 3, 4). The dorsal conjunctival sclerite is also broader in *nysias* than it is in *lestoni* (Figs. 7, 8).

Stalaria lestoni gives the impression of being a more elongate slender species than does *nysias*, but without a series of the latter available we have not been able to establish this.

Linnavuori's (1978) original description indicates that, in females, the third

antennal segment is longer than either the second or fourth segments "12:25:30:25 (female)." This may be a lapsus for this would be an unusual situation.

Stalaria nysias was described from Malakal on the Upper Nile (Sudan). The only other published record is that of Scudder (1982) from Senegal. This record may well be correct. We have examined a single female from Nigeria (Olatunde Ayoola Ave., Lagos, 6.III.1975 (Abdul Hamid)) which although having much longer antennae than the paratype noted above appears to be conspecific.

Stalaria nana NEW SPECIES

Fig. 10

Body relatively short and stout, nearly parallel sided. Head, anterior pronotal lobe, scattered punctures, and triangular area at base of scutellum dark red brown, strongly contrasting with pale yellow ground color of rest of body including pronotal collar, posterior lobe and appendages. Fourth antennal segment brown with distal $\frac{1}{4}$ yellowish. Hemelytra lacking distinct dark maculae, somewhat infuscated distally on clavus and along apical corial margin. Membrane pale translucent with areas between veins striped with pale brown and a pale white streak mesally on posterior half. Pronotum and scutellum with a few elongate upright hairs. Head, pronotum and scutellum with numerous appressed sericeous hairs, most numerous on head and laterally and mesally on anterior pronotal lobe. Anterior pronotal lobe impunctate, punctures on posterior lobe large and dark, but sparse and widely scattered.

Head little declivent anteriorly; tylus reaching or slightly exceeding middle of first antennal segment. Eyes set only slightly away from anterior margin of pronotum. Head length 0.78, width 0.78, interocular space 0.40. Anterior pronotal lobe rounded and moderately swollen, slightly broader than head across eyes, posterior lobe not elevated above anterior lobe, posterior margin very shallowly concave. Pronotal length 1.14, width 1.26. Scutellar length 0.74, width 0.50. Hemelytra narrowly explanate laterally, the margins straight. Midline distance apex clavus-apex corium 1.0. Midline distance apex corium-apex membrane 0.68. Mesosternum with a strongly shining median plate. Labium extending onto middle of mesosternum, but remote from mesocoxae. Length labial segments I 0.44, II 0.44, III 0.30, IV 0.30. Length antennal segments I 0.40, II 0.80, III 0.62, IV 0.76. Total body length 4.40.

Paramere with inner projection very broad and strongly down curved; shaft lacking a secondary tooth on inner margin (Fig. 10). Genital capsule similar to that of *lestoni*, but more ovoid with inner projection much thicker and sides of capsule opening nearly evenly concave (Fig. 17). Only one pair of holding sclerites present.

Holotype.—♂, TANZANIA: Ilonga, 26.II.1964 (light trap) (I. A. D. Robertson). In American Museum of Natural History.

Paratypes.—TANZANIA: 5 ♂, 4 ♀, same data as holotype. 12 ♂, 5 ♀, same 14.IV.1965. 1 ♂, same, 27.II.1964. 1 ♂, Ukiriguru, 13.VI.1961, (light trap) (I. A. D. Robertson). SOUTH AFRICA: Natal. 1 ♂, St. Lucia Park, Zululand, 26.I.1968, (E. Brinkman). 1 ♂, same, 24.I.1968. 1 ♂, same, 20.I.1968. In National Insect Collection (Pretoria, South Africa) and J. A. Slater collection.

There is relatively little variation in the type series. Most specimens appear to

have a completely dark brown fourth antennal segment. Rarely there is a narrow fuscous stripe on the posterior pronotal lobe on either side of the midline. One specimen has additional dark streaking on the posterior pronotal lobe midway between the meson and lateral margins. The coloration of the scutellum is somewhat variable, usually there are two wide diagonal pale stripes but frequently these coalesce posteriorly so that only the median dorsal part of the scutellum is dark.

Stalaria nana is a readily recognizable species by its contrastingly pale yellow posterior pronotal lobe and small size as well as by details of the parameres and genital capsule. It is somewhat isolated in *Stalaria* as is indicated by the presence of a single pair of holding sclerites.

Stalaria kisseis (Linnavuori)

Figs. 2, 11–13

1972. *Pachybrachius* nr. *ferruginosus* Slater (*nec* Stål), 72:2:61.

1978. *Pachybrachius kisseis* Linnavuori, 153:88.

1980. *Stalaria kisseis* Harrington, 167:91.

This is the largest species of *Stalaria*, some specimens reaching 7 mm in length. It is chiefly a dark red brown to almost chocolate colored insect with the hemelytra somewhat lighter. The posterior pronotal lobe is at most only slightly lighter than the anterior so that in most specimens the entire dorsal surface of the pronotum appears to be uniformly dark red brown. The fourth antennal segment usually has a pale annulus near the middle. The head, pronotum and scutellum bear numerous upstanding hairs. Linnavuori (1978) gives an excellent description and figures the antennal hairs which are much longer than are those of the other species of *Stalaria* (considerably exceeding the diameter of the segment).

As noted earlier, this is the species that Harrington (1980) considered to be *Pamera ferruginosa* Stål which she made the type species of *Stalaria*.

Stalaria kisseis has a pair of unique heavy branched conjunctival structures (Fig. 12). Harrington (1980) used this as part of the definition of *Stalaria*, but it has thus far been found only in *S. kisseis*.

Actually the aedeagus of this species has four kinds of sclerotized structures on the vesical conjunctiva (Fig. 11). In addition to the "typical comb-like structure" there is a pair of slender holding sclerites that are acutely pointed and strongly hooked apically (Fig. 2); a pair of distinct conjunctival spines (Fig. 13), one on each side of the sperm reservoir that are long and simple and a single slender rod-like sclerotization dorsad of the ejaculatory duct and lying parallel to it. The vesica appears to lack any distinct enveloping sclerotization.

Slater (1972) reported *kisseis* as "*Pachybrachius* nr. *ferruginosus*" from Upemba National Park, Zaire. Linnavuori's (1978) type material was from "Equatoria" Sudan on the Aloima Plateau. It has not been taken in West Africa.

Additional material examined: TANZANIA: 9 ♂, 20 ♀, Ilonga, 14.IV.1965, (light trap) (I. A. D. Robertson). 2 ♂, 1 ♀, same, 26.II.1964. 1 ♂, Ukiriguru, 21.XII.1961 (light trap) (I. A. D. Robertson). UGANDA: 1 ♂, 1 ♀, Kawanda 4.II.1958 (at light) (T. R. Odiambo). 1 ♂, same, 19–20.II.1958. 1 ♀, same, 1.III.1958. 1 ♀, same, 17.V.1958.

ACKNOWLEDGMENTS

We wish to thank the following for the loan or gift of material: Abdul Hamid (Sokoto University); the late Dennis Leston; Rauno Linnavuori (Turku, Finland);

J. T. Medler (formerly Ile-Ife, Nigeria); T. Odiambo (formerly Kwanda Res. Station, Uganda); I. A. D. Robertson (formerly Cotton Research Institute, Tanzania); and the members of the Lund University Gambia-Senegal Expedition.

We are indebted to Mary Jane Spring and Elizabeth Slater (University of Connecticut) for preparation of the illustrations and aid in the preparation of the manuscript respectively.

LITERATURE CITED

- Harrington, B. J. 1980. A generic level revision and cladistic analysis of the Myodochini of the world (Hemiptera, Lygaeidae, Rhyparochrominae). *Bull. Am. Mus. Nat. Hist.* 167: 49-116.
- Linnavuori, R. 1978. Hemiptera of the Sudan, with remarks on some species of the adjacent countries 6. *Acta Zool. Fennica* 153: 108 pp.
- Scudder, G. G. E. 1982. Recherches scientifiques dans les parcs nationaux du Sénégal IX. Hemiptera Lygaeidae du Parc National du Niokolo-Koba. *Mém. Inst. Fond. d'Afrique Noire* No. 92: 141-154.
- Slater, J. A. 1972. The Lygaeidae of Upemba National Park (Hemiptera: Heteroptera). *Parc National de l'Upemba-Mission G. F. de Witte. Fasc. 72(2): 17-77.*
- Slater, J. A. and L. Y. Zheng. 1985. A revision of the genus *Horridipamera* Malipatil. (Hemiptera: Lygaeidae). *J. N. Y. Entomol. Soc.* 92: 316-341.